STATE OF CALIFORNIA
Budget Change Proposal - Cover Sheet
DF-46 (REV 08/15)

Fiscal Year	Business Unit	Department	Priority No.
16-17	4440	State Hospitals	

Budget Request Name	Program	Subprogram
4440-001-BCP-BR-2016-GB	15.10 In-Patient Services	4380019

Budget Request Description
Unified Hospital Communications Public Address System – Phase 1

Budget Request Summary
The Department of State Hospitals (DSH) requests $6.5 million General Fund and 2 full-time permanent positions in 2016-17 ($1.6 million in out-years) for the first phase in the development of a Unified Hospital Communications (UHC) system to provide continuity and standardization throughout the state hospitals. Specifically, this request addresses the Public Address (PA) systems and related Local Area Network (LAN) systems at DSH-Coalinga and DSH-Patton.

Requires Legislation	Code Section(s) to be Added/Amended/Repealed
☐ Yes ☒ No	

Does this BCP contain information technology (IT) components? ☒ Yes ☐ No *If yes, departmental Chief Information Officer must sign.*	Department CIO Rogene Sears	Date 1/4/16

For IT requests, specify the date a Special Project Report (SPR) or Feasibility Study Report (FSR) was approved by the Department of Technology, or previously by the Department of Finance.

☒ FSR ☐ SPR Project No. 4440-119 Date: Pending Approval

If proposal affects another department, does other department concur with proposal? ☐ Yes ☐ No
Attach comments of affected department, signed and dated by the department director or designee.

Prepared By	Date	Reviewed By	Date
Michael Ruelas, PMO Director	1/5/16	Lupe Alonzo-Diaz, Deputy Director - Administrative Services (E. Edens for LAD)	1/4/16
Department Director Pam Ahlin (S. Glendinning for)	Date 1/4/16	Agency Secretary Kris Kent	Date 1-4-16

Department of Finance Use Only

Additional Review: ☐ Capital Outlay ☐ ITCU ☐ FSCU ☐ OSAE ☐ CALSTARS ☐ Dept. of Technology

BCP Type: ☐ Policy ☒ Workload Budget per Government Code 13308.05

PBA	Date submitted to the Legislature
Carla Castaneda	1-7-16

Analysis of Problem

A. Budget Request Summary

The Department of State Hospitals (DSH) requests $6.5 million General Fund and 2 full-time permanent positions in 2016-17 ($1.6 million in out-years) for the first phase in the development of a Unified Hospital Communications (UHC) system to provide continuity and standardization throughout the state hospitals. Specifically, this request addresses the Public Address (PA) systems and related Local Area Network (LAN) systems at DSH-Coalinga and DSH-Patton.

B. Background/History

The Department of State Hospitals (DSH) manages the nation's largest inpatient forensic mental health hospital system. Its mission is to provide evaluation and treatment in a safe and responsible manner, seeking innovation and excellence in state hospital operations, across a continuum of care and settings. The DSH is responsible for the daily care and provision of mental health treatment of its patients. In 2014-15, the DSH served almost 13,000 patients and the inpatient census was approximately 6,700 in a 24/7 hospital system, and approximately 600 outpatient census in its conditional release program. The DSH oversees five state hospitals and three psychiatric programs located in state prisons, employing approximately 12,000 staff. Additionally, the DSH provides services in jail-based competency treatment programs and conditional release programs throughout the 58 counties. The DSH's five state hospitals are Atascadero, Coalinga, Metropolitan – Los Angeles, Napa and Patton. The three psychiatric programs are through an interagency agreement with the California Department of Corrections and Rehabilitation (CDCR), treating inmates at prisons in Vacaville, Salinas Valley and Stockton.

To assist with meeting these business obligations, DSH staff throughout the hospital system requires regular, accurate and up-to-date hospital communications. PA systems are a critical component to the overall safety of staff and patients. While every DSH hospital has some form of a PA system, these PA systems lack sufficient campus coverage, are outdated, in constant need of repair, and no longer under warranty. For example, the PA system at DSH-Coalinga is ten years old and DSH-Patton is over 30 years. The DSH proposes the integration of, and where necessary replacement of, existing PA systems into a more comprehensive and reliable network based PA system with wider campus coverage at the Coalinga and Patton State Hospital facilities. DSH-Coalinga and DSH-Patton are the focus of the proposal because of its critical needs as both locations have the least amount coverage and are most prone to errors. Other locations will be updated at a later date.

The new PA system will allow for many health and safety improvements in the communication and dissemination of information quickly and intelligibly throughout the hospital campuses. New technology will allow for 2-way communications between public speakers in key areas and dispatch, targeted announcements to specific hospital areas to prevent disruption in non-affected areas, clear and intelligible announcements, and message prioritization to prevent concurrent message delivery. Additionally, improvements and upgrades will help minimize the number of failures and unplanned down time thereby reducing potential health and safety implications for staff and patients.

As a part of this project, the DSH will also need to upgrade its existing LAN system wherever necessary to support the new PA technology. These upgrades will be made in accordance with DSH architecture and adhere to the DSH medical grade standard.

For many of the DSH-Coalinga and DSH-Patton aging PA systems, the sound produced is either too quiet to be audible in a busy hospital environment or produces sound that has low intelligibility. Intelligibility is defined as the capability of being understood or comprehended (distinguishable and understandable). Voice alarms that are intelligible ensure that vital emergency messages transmitted through a building's PA system are clearly heard and understood.

In a life-threatening situation, the right staff must get to the right place as quickly as possible. There is no room for uncertainty. Whether it is a doctor page, an assault incident, a security incident or a fire, the PA system must reliably broadcast clear messages that everyone understands.

Without the ability to intelligibly broadcast emergencies or security incidents throughout the facility, the Department puts its staff and patients at substantial risk. The DSH has the opportunity to ensure that all staff and patients can be reached in emergency situations to reduce the likelihood of patient and staff injury by installing network based PA systems with full campus coverage.

Analysis of Problem

There are three business areas impacted by this proposal. They are the clinical programs, law enforcement and dispatch operations, and Technology Services Division.

The Department's Clinical programs provide direct treatment to patients. These staff primarily work on the floor in direct contact with patients and, as such, cannot rely on standard communication methods such as phones or email. Instead, they are heavily dependent on other communication technology, such as the Personal Duress Alarm System (PDAS) or active PA systems for receiving emergency information.

The primary function of the law enforcement and dispatch program area is staff and patient safety. To protect workers and patients, the DSH employs hospital police and safety staff. These staff utilize PA systems to convey emergency information to the clinical program staff in a rapid and efficient manner.

The Technology Services Division's (TSD) mission is to provide information technology solutions to support the DSH facilities through collaborative, effective and efficient service delivery. While TSD does not currently manage existing analog PA systems, they will be responsible for managing and maintaining network-based PA systems deployed through this proposal.

There are currently no positions dedicated to the PA systems though the DSH has determined that as many as 27.3 personnel years (PY) are spent annually managing and maintaining current PA systems statewide. These positions are not specifically budgeted for PA systems and are not whole positions. They reflect the time spent by many various staff maintaining and managing the PA systems. Maintaining and managing these systems, redirects them from their existing workload and does not provide adequate systematic support. This isn't acceptable for a critical life and safety system in a 24/7 hospital environment.

Likewise, PA system expenses are not specifically allocated in the DSH budget however the Resource History illustrates an estimated average of the annual cost of existing systems. This is the cost to keep the system up and running.

Resource History
(Dollars in thousands)

Program Budget	2011-12	2012-13	2013-14	2014-15	2015-16
Authorized Expenditures	0	0	0	0	0
Actual Expenditures*	$1,704,726	$1,704,726	$1,704,726	$1,704,726	$1,704,726

Workload History

Workload Measure	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Number of PA system announcements per day**	125	125	125	125	125	125
Number of PA system down time events per month**	15	15	15	15	15	15
Percentage of facilities with PA coverage	60%	60%	60%	60%	60%	60%
Percentage of facility zones that support zone targeting	0%	0%	0%	0%	0%	0%
Percentage of speakers capable of 2-way communication	0%	0%	0%	0%	0%	0%
Percentage of speakers capable of prioritizing messages	0%	0%	0%	0%	0%	0%

* Actual expenses on PA systems come from a variety of sources including program staff, plant operations staff and invoices, technology services staff and invoices, and other contract services. The amounts provided are an estimate based on available information.

**The numbers provided are a daily average determined by a survey of dispatch staff and other employees who use PA systems at the facilities.

C. State Level Considerations

This proposal is in alignment with the DSH TSD Management Plan State Information Technology Policy for consolidating network resources throughout the State and enabling the use of enterprise applications. This action is a part of the long-term DSH Information Technology Strategy and Enterprise Architecture and advances the DSH mission.

Additionally, this proposal addresses several goals of the Department's Strategic Plan, as well as California State IT strategic goals.

DSH Goals:

- *Increased Worker and Patient Safety.*
    - UHC-PA will provide the necessary ability to notify staff of events in real-time during emergency situations and close the potential failure gap identified with the PDAS notification system.

TSD Goals:

- *Deliver Medical Grade IT Infrastructure and Services that are Reliable, Secure and Sustainable.*
    - Wherever necessary for PA system implementation, UHC-PA will provide a Local Area Network infrastructure that has the necessary bandwidth and redundancy to meet medical grade standards thereby diminishing the single points of failure.

- *Develop, Deploy, and Maintain Medical Grade Enterprise Application Solutions that are Reliable, Secure and Sustainable.*
    - UHC-PA is being developed and deployed as an enterprise system that meets specific business needs and objectives in a secure and sustainable technology.

- *Efficient, consolidated, and reliable infrastructure and services.*
    - Wherever necessary for PA system implementation, UHC-PA will leverage reliable technology infrastructure that is secure and sustainable.

- *Ensure the state's technology and public safety communication infrastructures have robust and reliable disaster recovery capabilities to support the continuity of government services.*
    - Wherever necessary for PA system implementation, UHC-PA will provide the final layer of infrastructure foundation to ensure that in the event of an emergency or disaster, the DSH will still be able access information and services.

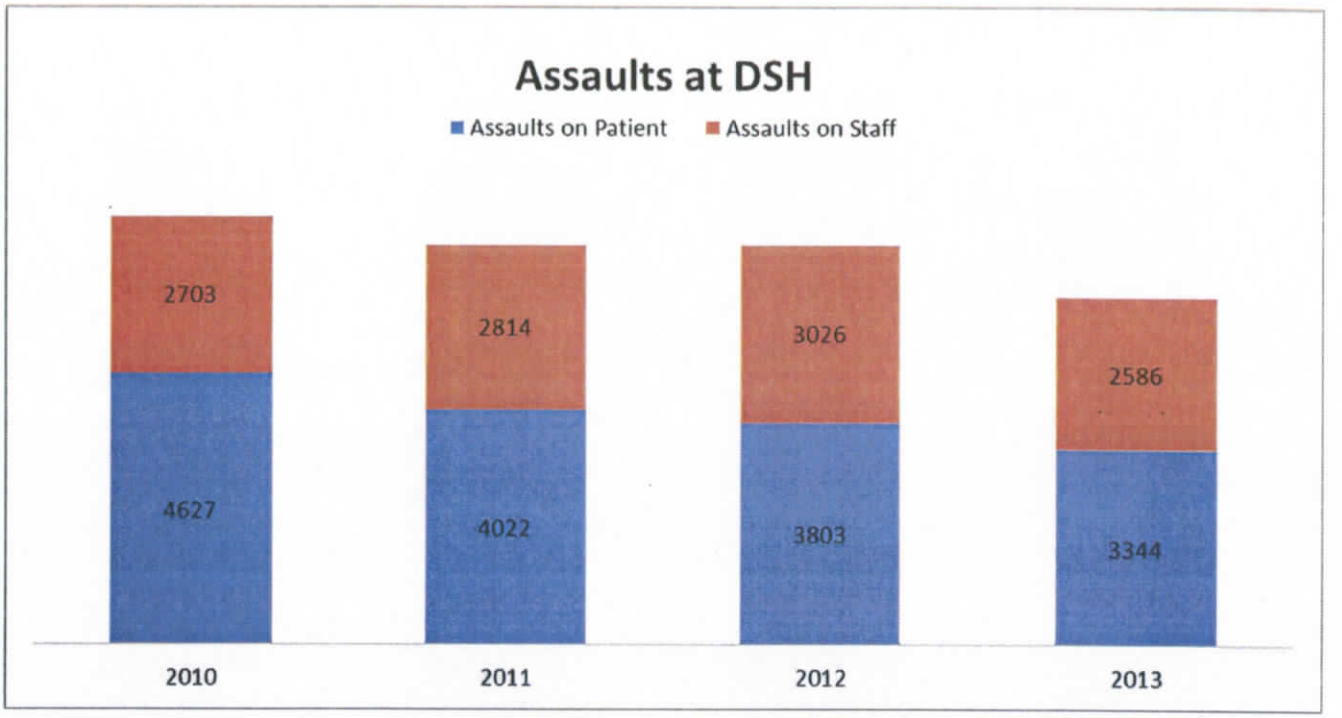
D. Justification

The DSH has the responsibility to ensure the safety and security of the people in its facilities, both staff and patients. In the event of an emergency situation, hospital administrators need to get a large number of people to follow instructions. The inability of emergency notification systems to provide voice instructions may have catastrophic consequences. This proposal focuses on the first phase of UHC-PA which includes Coalinga State Hospital (DSH-Coalinga) and Patton State Hospital (DSH-Patton).

<u>PAs Support Existing PDAS Function</u>

This functionality is especially important for use with the recently deployed Personal Duress Alarm System (PDAS). The objective of the PDAS project is to improve safety at all state hospitals by implementing a personal duress alarm system which has improved the safety of patients and hospital staff.

The DSH has a highly aggressive population. The table below shows the magnitude of assaults in our facilities. The PA system is key to ensuring safety.



PDAS is scheduled to complete in early 2016 making the PA system the next logical and practical step in the Department's strategic goal to increase safety for patients and staff. Functioning, campus wide PA systems are a key component in achieving the full benefits of PDAS because it provides the necessary ability to announce specific critical information in the event of an incident or emergency. Without a functioning PA system integrated with PDAS, the full benefits of PDAS cannot be realized.

Additionally, the PA systems act as a critical stop-gap should the PDAS tag suffer a temporary failure. The primary reason PDAS tags could fail to function properly or receive a message is the communications protocol the PDAS system uses to broadcast a message out. In testing, it has been found to rank regularly within the high 98th percentile. The text messages are sent via a protocol that if enough message packets are dropped the message never arrives. As a result, there is no guarantee of delivery of the message. This is why it is critical to have the PA system in place. No other networking protocol would work to broadcast on PDAS because the volume of traffic and the delays it would cause the system. Also, the tag can fail for non-technical reasons, such as the tag not being worn in the proper location or the staff person letting the tag discharge to a point where it cannot receive a signal.

DSH-Coalinga

At DSH-Coalinga, the current PA system fails on a regular basis. System testing showed that, due to the equipment's age, the network driver chips in each of the controllers were weak and no longer capable of proper communication. Replacement chips were installed but need to be monitored regularly to prevent the controllers from overloading the system and failing again. Today computer systems are not built with components that last decades. This is the case at CSH, the hospital has invested funds to replace parts, but the amplification of sound is still a major issue. Every computer system requires a refresh period over time, which is what has become apparent at CSH. The existing PA system warranty expired over nine years ago, with limited options for repair. Therefore, the risk of the aging system outweighs the impact of the cost to maintain the system.

DSH-Patton

At DSH-Patton there are 38 buildings outside the secured treatment area. Of those, only eight buildings have a functional amplifier and speaker system which allows dispatch to make announcements to staff. In the event of an emergency which would require quick mobility and dissemination of information, almost 80% of the campus would need to be reached manually – which would require staff running or driving carts in order to notify staff in those impacted areas. Inside the secured treatment area, 20 modular trailers and seven day-use buildings lack public address capability.

Analysis of Problem

The DSH considered continuing maintenance, repair, and replacement of current outdated and malfunctioning PA systems however, the DSH faces many challenges with its current infrastructure. The current systems meet only basic operational needs and face regular outages. Through background research regarding existing systems, the DSH was able to determine the following:

To continue operating with the current PA systems, the DSH would need to do expensive additions and replacements. Because the cabling system and overall operating infrastructure is challenged by increasingly more traffic (due to upgrades), the system faces an increase in failures and regular outages. This would drastically increase safety risks to both patients and staff if they are not able to hear timely emergency information. Additionally, it is increasingly difficult for the DSH maintenance staff to replace burned out or malfunctioning components as they are becoming obsolete.

The fees for working with the in-ground infrastructure includes the prices for noted materials and equipment necessary for retrofitting the cables for specific needs, and costs for excavation of trenches and temporary fire alarm setup costs..

Retrofit of the copper infrastructure to address some of the business needs would be a temporary solution.

E. Outcomes and Accountability

In order to have fully updated PA system, the system must be integrated with PDAS. This will lead to increased two-way communication within the facility. As a result, the PA system will increase existing safety measures within the facility. Below are the workload measures:

Projected Outcomes

Workload Measure	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Number of PA system announcements per day	125	125	125	125	125	125
Number of PA system down time events per month	15	15	15	2	2	2
Percentage of each facility with PA coverage	60%	60%	60%	95%	95%	95%
Percentage of facility zones that support zone targeting	0%	0%	0%	100%	100%	100%
Percentage of speakers capable of 2-way communication	0%	0%	0%	5%	5%	5%
Percentage of speakers capable of prioritizing messages	0%	0%	0%	100%	100%	100%

The DSH has examined the current topography of its PA systems and its proposed future state. The DSH will use a combination of the following methodologies to measure its success in this project:

- Reports generated from the help desk ticketing system on tickets related to PA system outages.
- Performing on-site surveys of equipment installation.
- Performing audio tests at various campus locations to ensure coverage.
- Rigorous and continuous system testing.

F. Analysis of All Feasible Alternatives

Alternative 1: Upgrade system for DSH-Patton and DSH-Coalinga

This alternative would allow the DSH to realize all of the objectives for Patton and Coalinga PA Systems, the two facilities with the highest level of deficiency, while significantly reducing the initial financial commitment of the state and the overall risk of the project.

Pros:

- Minimizes initial financial commitment.
- Reduces the project's overall risk by reducing the size of the project.
- Permits reliable repairs to maintain the system effectively.

- Achieves optimal campus coverage for these two sites with the greatest need.
- Supports disaster recovery scenarios.

Cons:

- May result in duplication in services and efforts for implementation for other facilities.
- Higher total cost if completed for all five hospitals and the DSH-Sacramento.

Alternative 2: Implement system upgrade for all five hospitals and Sacramento.

Pros:

- Lowers total cost for completing all five hospitals and the DSH-Sacramento.
- Reduces the need to duplicate services and efforts for implementation.
- Permits reliable repairs to maintain the system effectively.
- Achieves optimal campus coverage at all DSH sites.
- Supports disaster recovery scenarios at all DSH sites.

Cons:

- Higher initial financial commitment.

Alternative 3: Reject the proposal and maintain the existing PA systems.

Pros:

- No initial start-up costs.

Cons:

- Higher costs associated with the service and replacement of the aged PA system equipment beyond its warranty and operational life.
- Does not meet the campus coverage needs required by the business.
- Regular outages of indeterminate length.
- Does not support a disaster recovery plan.

G. Implementation Plan

The DSH will break the implementation into two waves to mitigate risk. Each wave will be a single hospital. The following are the high-level key milestones defined for the project:

Estimated Completion Date	Task or Milestone
September 2016	Project Kick-Off
June 2017	Network Data Circuits complete – Wave 1
August 2017	Network Data Circuits complete – Wave 2
September 2017	PA systems complete – Wave 1
November 2017	PA systems complete – Wave 2
December 2017	Project Acceptance and Close Out
June 2018	System stabilization complete

H. Supplemental Information

Due to its integrations with PDAS and its impact on the health and safety of both patients and staff, the PA systems are considered mission critical systems for the DSH. The Department understands that the UHC project can only be successful if it includes a sustainable staffing model for maintaining and operating the system after implementation. Current PA systems are non-networked and analog in nature and as such are not maintained by IT staff, they are maintained by Plant Operations staff. Once implemented, the PA systems will be IP-based and part of the overall DSH network. PA system management will include responsibility for the entire LAN infrastructure related to PA systems as well as any end-point devices utilized by the PA system.

Current staff do not have the capacity for redirection from other projects, programs or duties to fill UHC resource needs for implementation or ongoing M&O.

The table below shows the additional IT resource requirements requested to support the proposed alternative:

Resource	Function	Primary Work Location	Quantity
SSS II (Technical)	Network Engineer	Coalinga/Patton	2.0

NOTE: All positions listed are considered necessary and critical positions for the implementation and ongoing M&O of the UHC PA System Phase 1 project.

SSS II (Technical) – Network Engineer (2 PYs)

	SSS II (Technical) Tasks	One Time Hours	Ongoing Hours
1	Network Systems Support: Implement, configure, manage and maintain the more complex network operating systems related to the PA systems at the hospitals. Work with software and hardware vendors and other subject matter experts to plan, design, test, and deploy systems. Debug hardware and software problems and resolve the more challenging and advanced network system and integration problems. Develop project plans, statements of work, complex reports, analyses, and recommendations to management for on-going and future improvements for network systems support. Provide technical expertise and support for Technology Services Division (TSD) Help Desk Staff on resolving complex problems that arise in the user community.	1000	830
2	PA System Support: Plan, design, procure, test, install, configure, monitor, and maintain all end-points associated with PA systems including speakers, two-way communication devices, IP based integrated phones, and dispatch equipment. Develop project plans, statements of work, complex reports, analyses, and recommendations to management for on-going and future improvements for PA system management and design.	640	730
3	System monitoring and testing: Plan, design, and conduct regular and rigorous testing of all components associated with the PA system including the network and end-points. Troubleshoot any system outages and assist help desk and infrastructure staff with issue resolution as necessary.	400	480
SSS II (Technical) – 2 PY TOTAL HOURS FOR EACH POSITION: 1,800 One Time / 1,800 Ongoing		**2,040**	**2,040**

I. Recommendation

The DSH recommends the approval of Alternative 1, which would allow the DSH to realize all of the objectives for the two facilities with the highest level of deficiency while significantly reducing the initial financial commitment of the state and the overall risk of the project.

BCP Fiscal Detail Sheet

BCP Title: Unified Hospital Communications-Public Address System Phase 1

DP Name: 4440-030-BCP-DP-2016-GB

Budget Request Summary

	FY16					
	CY	BY	BY+1	BY+2	BY+3	BY+4
Positions - Permanent	0.0	2.0	2.0	2.0	2.0	2.0
Total Positions	**0.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Salaries and Wages						
Earnings - Permanent	0	158	158	158	158	158
Total Salaries and Wages	**$0**	**$158**	**$158**	**$158**	**$158**	**$158**
Total Staff Benefits	0	66	66	66	66	66
Total Personal Services	**$0**	**$224**	**$224**	**$224**	**$224**	**$224**
Operating Expenses and Equipment						
5301 - General Expense	0	16	16	16	16	16
5304 - Communications	0	2	2	2	2	2
5320 - Travel: In-State	0	94	48	2	2	2
5322 - Training	0	10	10	0	0	0
5324 - Facilities Operation	0	10	10	10	10	10
5340 - Consulting and Professional Services - Interdepartmental	0	2,473	260	286	286	286
5346 - Information Technology	0	2	0	0	0	0
539X - Other	0	3,665	224	247	247	247
Total Operating Expenses and Equipment	**$0**	**$6,272**	**$570**	**$563**	**$563**	**$563**
Total Budget Request	**$0**	**$6,496**	**$794**	**$787**	**$787**	**$787**

Fund Summary

Fund Source - State Operations						
0001 - General Fund	0	6,496	794	787	787	787
Total State Operations Expenditures	**$0**	**$6,496**	**$794**	**$787**	**$787**	**$787**
Total All Funds	**$0**	**$6,496**	**$794**	**$787**	**$787**	**$787**

Program Summary

Program Funding						
4380019 - In-Patient Services	0	6,496	794	787	787	787
Total All Programs	**$0**	**$6,496**	**$794**	**$787**	**$787**	**$787**

BCP Title: U[redacted]ed Hospital Communications-Public Address System P[redacted]e 1 DP Name: 4440-030-E[redacted]-DP-2016-GB

Personal Services Details

Positions	Salary Information Min	Mid	Max	CY	BY	BY+1	BY+2	BY+3	BY+4
1373 - Sys Software Spec II (Tech) (Eff. 07-01-2016)				0.0	2.0	2.0	2.0	2.0	2.0
Total Positions				**0.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**

Salaries and Wages	CY	BY	BY+1	BY+2	BY+3	BY+4
1373 - Sys Software Spec II (Tech) (Eff. 07-01-2016)	0	158	158	158	158	158
Total Salaries and Wages	**$0**	**$158**	**$158**	**$158**	**$158**	**$158**
Staff Benefits						
5150350 - Health Insurance	0	11	11	11	11	11
5150450 - Medicare Taxation	0	2	2	2	2	2
5150500 - OASDI	0	10	10	10	10	10
5150630 - Retirement - Public Employees - Miscellaneous	0	32	32	32	32	32
5150700 - Unemployment Insurance	0	1	1	1	1	1
5150800 - Workers' Compensation	0	2	2	2	2	2
5150900 - Staff Benefits - Other	0	8	8	8	8	8
Total Staff Benefits	**$0**	**$66**	**$66**	**$66**	**$66**	**$66**
Total Personal Services	**$0**	**$224**	**$224**	**$224**	**$224**	**$224**